Bullock Clark, on the establishment and organisation of the Maryland Weather Service; a description of the physiography of Maryland, by Dr. Cleveland Abbe, jun.; a report on the meteorology of Maryland, by Dr. Abbe, Mr. F. J. Walz and Dr. O. L. Fassig; and a contribution on the aims and methods of meteorology, by Prof. Cleveland Abbe, already noticed in these columns (vol. lxi. p. 448). The illustrations are numerous, instructive, and of a very high class, most of them being full-page collotype plates or lithographs. No State or country has given to the scientific world a volume in which the operations of the "Weather Service" are interpreted more liberally, or the work presented in a more elaborate *format*.

Volta e la Pila. By Prof. Augusto Righi. Pp. 40. (Milan: Tip. Bernardoni di C. Rebeschini, 1900.)

THIS is an inaugural discourse delivered by Prof. Righi on September 18, 1899, at the National Electrical Congress at Como. It deals with (1) the science of electricity prior to Volta; (2) the scientific work of Volta considered apart from his discovery of the pile; (3) Galvani's discovery of electricity of contact; (4) the pile; (5) the theory of the pile; and (6) conclusions. In an appendix, Prof. Righi gives a note on the theories of the pile, in which he expresses favourable opinions on the "osmotic" theory.

LETTERS TO THE EDITOR.

[*The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts intended for this or any other part of* NATURE. *No notice is taken of anonymous communications.*]

An Optical Phenomenon.

IN connection with Prof. Simon Newcomb's letter on "Terrestrial Gegenschein" (NATURE, October 5, 1899) and the subsequent letters of Mr. Mallock (NATURE, October 12 and November 9, 1899), I desire to call attention to an analogous and very beautiful phenomenon of perspective which I should have mentioned at the time but that the winter season of the year is not favourable to its observation in this country.

When the sun is high and shining brightly in a clear sky, let an observer stand so that the shadow of his head falls on the surface of water that is deep, clear, but not quite clear, and slightly agitated by the wind. He will observe that from the place where the shadow of his head falls shafts of light seem to radiate in all directions. When once well observed, the phenomenon is very striking, but it has surprised me to find how few persons have noticed it. I first observed it many years ago, when I used daily, about mid-day in summer, to cross the bridge over the channel leading to the boat store in the Portsmouth Dockyard, near the main entrance. But it was not till a year later, on Ulleswater, that I found the explanation. The lake was there turbid in parts from the washings of mines, but quite clear in others. Standing up in a boat, one could see the phenomenon very clearly where there was very slight turbidity, but not if the water was quite clear, nor if there was much turbidity, and never in a dead calm. This gave the explanation. The convexities of the surface, when there is a slight agitation, acting as lenses, split up the otherwise uniform illumination into separate, parallel shafts of light, each consisting of slightly convergent rays, which, traversing the liquid, are rendered visible by the suspended particles that they illuminate. These shafts seen in perspective have their point of apparent convergence exactly opposite to the sun, *i.e.* in the shadow of his head. If the water is smooth, there are no particles to illuminate and reveal the shafts; if too turbid (or too shallow), the light does not penetrate far enough. If the sun be too low in the sky, too little light enters the water; if it shines through clouds, so that the source is diffuse, a uniform illumination results. Hence the rays are not easily noticed in winter.

After the phenomenon has once been well seen under such circumstances as I have described, one can hardly enter a boat on a bright day without being haunted by it, and realising that, although the shadow of one's head may not actually fall on the water, yet every streak of light in the water radiates from it.

A. M. WORTHINGTON.

R.N Engineering College, Devonport, July 22.

Temperatures of Recently Killed Chamois.

MR. E. N. BUXTON, in his fascinating "Short Stalks" remarks (p. 38, footnote): "A friend of mine once took the temperature of a freshly killed chamois, and it stood at 130° F." There is no doubt that many professional chamois hunters believe that the temperature of the animal is considerably higher than that of domestic animals.

During the last three years I have determined the rectal temperature of twenty-nine recently killed chamois.

These may be divided into three classes.

A.—*Those successfully stalked and dropped dead by the first shot.* (12 observations.)

With two exceptions, the temperatures, taken in every case within five minutes of death, lie between 101°·1 and 101°·9, the average being about 101°·5 F., or 38° 6 C.

The two exceptions were (i.) a kid four or five months old, the temperature of which was 103°·2 F., or 39°·6 C., and (ii.) a doe which had received a severe flesh-wound in the back eight days previously, the temperature of which was 102°·4 F., or 39°·1 C.

B.—*Those shot au galop.* (7 observations.) These animals all dropped dead in their tracks, or died almost immediately.

The temperatures on the whole were found to be distinctly higher than in class A, being 101°·5, 102°·3, 102°·4, 102°·9, 102°·9, 103°·5 and 104°·5 respectively.

The first four of these had run from 40 to 50 yards, the fifth about 200 yards, and the last two about 100 yards. The last two were young bucks, which, to judge from the appearance of their incisor teeth, were four and three years old respectively.

C.—*Those wounded at the first shot, but only brought to bag after some interval.* (10 observations.)

Here the temperatures are, on the whole, still higher.

The lowest (101°·7) was that of an animal which ran 50 yards after the first shot, and was then dropped dead by a second.

The next (102°·4) ran about 300 yards. The third (102°·9) was wounded in the stomach, then walked about 250 yards towards me, and was dropped by a second shot at about 30 yards.

The fourth (103°·1) ran about 200 yards. The fifth and sixth (103°·3 and 103°·5) were shot through the kidneys, but were not killed outright by the shot.

The remaining four showed temperatures of 104°·9, 105°·6, 106°·2 and 106°·7.

Of these the first had its fore-leg broken, and was recovered twelve hours later.

The second and fourth were recovered about half an hour after being wounded.

The third was an animal whose hind-leg was broken. It then escaped into another valley, and hid itself in a cave on a rock-wall, where it was spied about four hours later. A second shot failed to hit it, but drove it out of the cave. It then tried to climb the steep rocks above it, and after twice failing to overcome a *mauvais pas*, slipped and fell about 100 feet, and was killed by the fall.

Results similar to these were obtained in 1898 by a Swiss friend of mine. Some of the animals were driven by dogs, and these always showed a higher temperature than those stalked and killed by the first shot, the temperatures of the driven animals varying from 103°·6 to 105°·8.

The highest temperature obtained by him was 107°·6 (42° C.). This was an animal which was severely wounded in the back, then lost till twenty-four hours later, when it was found and killed by a dog.

How far the average temperature given under A represents the normal temperature of the living chamois, I am unable to say, because I do not know to what extent sudden death by a bullet would be likely to affect the reading of the thermometer. Perhaps some physiologist would kindly throw some light upon this point.

To save the trouble of calculation to any foreign reader who may see this letter, I may add that 38° C. = 100°·4 F., 39° C. = 102°·2 F., 40° C. = 104° F., 41° C. = 105°·8 F., 42° C. = 107°·6 F.

G. STALLARD.

Rugby, July 12.